Propulsion Environmental Working Group

A Collaboration for Advanced Sustainment Technology Insertion

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Report Documentation Page

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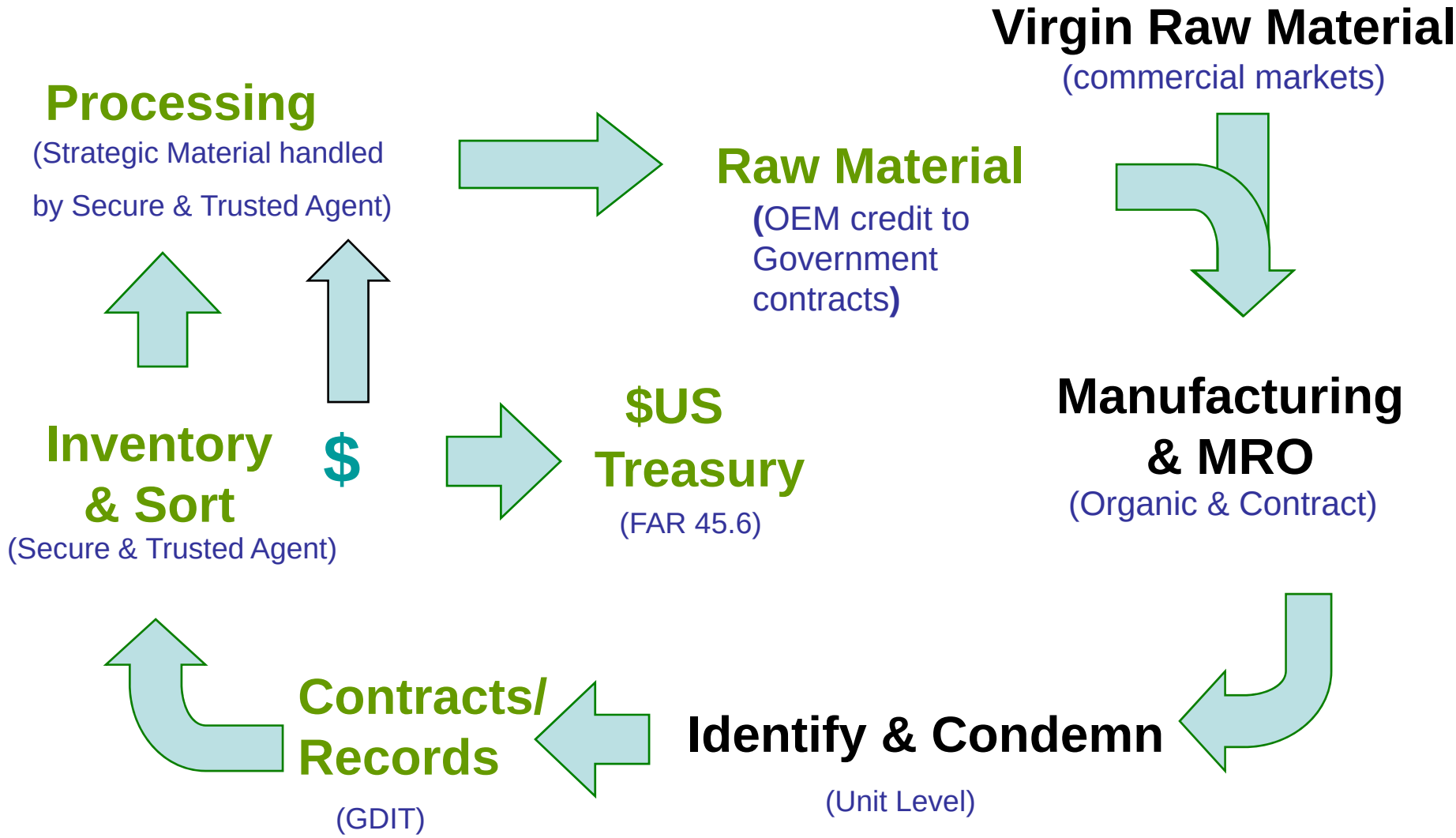
PEWG Mission

- Work within the AF propulsion community to discover and insert safe, clean, and effective manufacturing, maintenance, repair and overhaul (MRO) technologies to improve process & product
  - Performance
  - Affordability
  - Competitiveness

Strategic Materiel Recovery and Re-use Program



PEWG PROJECTS

Number		Title	
PEWG	**HQ AFMC/A5S**	**PSTWG (Tinker)**	
LP700	AA1004	**Powder Coating Phase IV**	**P2**
LP701	AA1045	**Supersonic Particle Deposition (SPD) Phase IV**	**P2**
LP702	AA1015	**Coating Removal Process (CRP) – CrC plus**	
LP703	AA1038	**Low Radioactivity Thermal Barrier Coating (TBC)**	**Ohio/NASA**
LP704	AA1051	Non-solvent Cleaning Process	
LP705		Advancements in Plating Shop Efficiencies	
LP706	AA1033	Laser Inspection of Coated GTE parts	
LP707	AA1048	Plasma Resource Recovery System (PRRS)	
LP708	AA1028	Laser Peening to Preserve GTE part life	
LP709	AA1055	Slurry Feed Nano Plasma Repair Process	
LP710	AA1050	Optical Fusion Component Repair	
LP711	AA1032	**Advanced Coating Application Module (ACAM)**	**FCT**
PEWG	**HQ AFMC/A5S**	**MRO&PTWG (Hill)**	
LP750	**AA1014**	Stripping Solution - **WCCoCr**	
LP751	AA1040	Parent Material Restoration – “Recast”	
LP752	AA1037	Low Density Coatings for Component Repair	
LP753	AA1036	High Velocity Oxy Fuel (HVOF) ID Gun	
LP754	AA1043	**Laser Cladding/Additive Manufacturing (LAM)**	**TAFB**
LP755	AA1029	No-strip/Touch-up Repair	
LP756	AA1057	Camouflage Tire and Wheel Coating	
LP757	AA1046	Single Part Wheel Paint (Low VOC)	
LP15		**Qualify CERAL 3450 & produce in US**	**FCT**
LP16		**Qualify portable hand Held Laser Welding**	**FCT**

Coating Removal Process OC-ALC – Propulsion
PEWG LP 702

Description

- An “intelligent” coating removal process (technology) that attacks a duplex coating’s bond coat without causing damage to the substrate.
- “Green” - clean, safe, environmental and worker friendly
- May be utilized in Lean cell manufacturing
- Support Tinker AFB Transformation

Problem Statement

- Duplex coatings, such as Thermal Barrier Coatings (TBCs) used on augmentor components, are difficult to remove without damaging the part.
- Current methodology, grit blasting, damages substrates contributing to increased scrap rate.
- Blasting with material creates HAZWASTE that needs to be removed at increased cost.

Deliverables

- Formula to remove duplex coatings
- Test Report
- License to use
- Final Report
- First Article

Funding Sought

FY 08	FY09	FY10
Funded	$450	$200K

OC-ALC/YP POC
James “Mickey” Conklin
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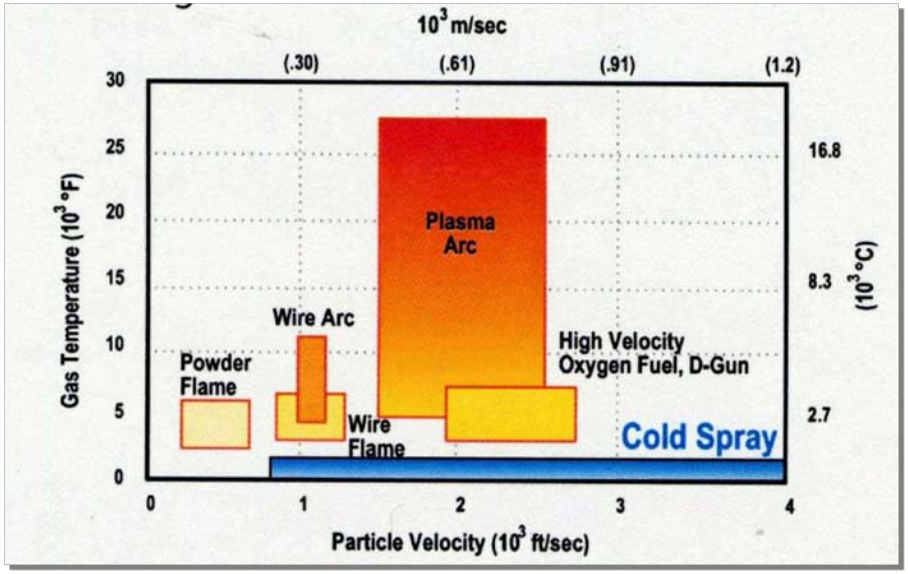
Supersonic Particle Deposition – Propulsion
PEWG LP701



Description

- Supersonic Particle Deposition, or Cold Spray, Technology is emerging as a viable repair alternative
- The ability to produce coatings without inducing heat results in coatings with very low residual stress.
- Low residual stress contributes to the ability to produce thick coatings without the effects of spallation.

Problem Statement

- Thermal Spray Coating Technology employed at the depot has a limitation on the thickness of the coatings that it can produce. This is due to the residual stresses in the coating that are inherent with high-temperature processes.
- Often times the thin coatings produced by the traditional Thermal Spray Process represent the limiting factor when attempting to salvage an MRB component.

Deliverables

- Technology Report - Final
- New Process for 76 PMXG
- Identify new equipment
- Update TO pages

Funding Sought

FY 08	FY09	FY10
Funded	$200K	$200K

OC-ALC/YP POC
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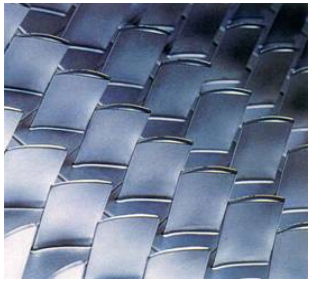
Ceral 3450 - Chrome Free Corrosion Protection



Keeping Assets In The Field And Out Of The Depot

Technology

- An environmentally friendly coating that will extend the service life of strategic components; aircraft, engines, ground vehicles.
- Aluminum-Ceramic retards corrosion / erosion
- Drop-in replacement for existing hazardous coating used throughout DoD.

Benefits To The Warfighter

- Increase time-on-wing, time on station, reduce shop visits, lower overall cost, fuel savings
- Presently being used throughout NATO and EU.

Participants

- Sponsors: USAF, USN
- Gov't Contributors: AFRL, OC-ALC/LR, 76th PMXG/CC
- Industry: Gebr.M und M.Morant, Grassau, Germany

Schedule

• Test Plan	1QFY07
• Functional Testing	2QFY07
• Engine Testing	3QFY07
• Test Review	1QFY08
• Procurement	2QFY08

POC: Bill Coppedge, Ph (405) 736-3699, DSN 336-3699
PM: Col. Brian Tri, Ph (405) 736-2041, DSN 336-2041

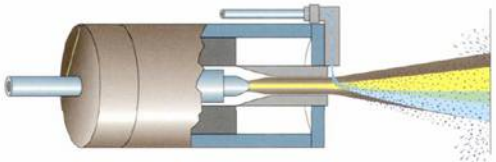
Funding ($M)

	FY07	FY08	Total
FCT	Funded	Funded	0.95M
AF (F100 AMT)	1.0M	1.0M	2.0M

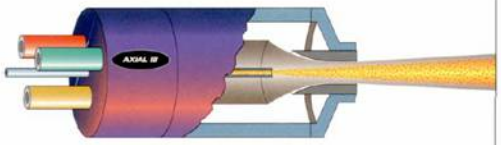
Benefits

- RDTE Cost Avoidance: $1.5 - $3.0M
- O&S Cost Avoidance: $10M
- Procurement Cost Avoidance: $300K/yr
- Procurement Potential: >$1M/yr
- Other: Results of previous (non-US) testing are available and can be used to offset US testing costs.

Qualify Advanced Coating Application Module
PEWG LP 711



Traditional Radial Plasma Gun



Axial III Plasma Gun

Phenomenal Deposition Efficiencies and Rates of Deposit

Reactive Metal Spraying (Ti, Zr, Al…..)

Blended and Graded Coatings

Allows for higher particle velocities & temperatures

High quality advanced coatings for life of part wear, corrosion resistance, and thermal barrier protection

Description

- **Advanced coating application module (ACAM) with axial powder injection providing high deposition efficiency, high spray rates**
- **Opportunity for micro and nanopowder coating application development incorporating metallics, ceramics, Thermal Barrier Coatings, Carbides and plastics**
- **Faster, cheaper, and produces better quality coatings than conventional Plasma Spray systems - utilizes nitrogen: others use expensive helium.**
- **Last longer, wear less, and be more reliable = MTBR increase**

OC-ALC/YP POC
James “Mickey” Conklin
405.739.7816

- **Government Contributors: OC-ALC, PEWG**
- **Industry: Northwest Mettech Corp, Vancouver, BC**

Schedule

• Contract for Test System	1QFY08
• Prepare Test Protocol	2QFY08
• Perform Testing	4QFY08
• Procurement	2QFY09

Funding

FY08	FY09	Total
Funded	Funded	$1100K

Benefits

- **TRL9 = RDTE Cost Avoidance: $11M**
- **O&S Cost Avoidance: $5M**
- **Procurement Cost Avoidance: $1.2M/unit**
- **Fielding Reduction: 4+ years (COTS System)**

2008 Summer PEWG

HOLIDAY INN

6200 NORTH ROBINSON DRIVE
OKLAHOMA CITY, OK 73118

June 16th – 19th

www.pewg.com